COURSE OUTLINE – subject to changes:

L-1 Mon 25 Aug welcome to MCS 507 – a tour of Python and Sage
L-2 Wed 27 Aug numbers and formulas – symbolic and numeric computing
L-3 Fri 29 Aug interactive computing – mathematical modeling
   Mon 1 Sep Labor Day holiday. No classes.
L-4 Wed 3 Sep loops and lists – while, for and repeat loops
L-5 Fri 5 Sep Monte Carlo methods – list comprehensions
L-6 Mon 8 Sep tuples and nested lists – list manipulations
L-7 Wed 10 Sep defining functions – lambda functions
L-8 Fri 12 Sep if and else – recursion and enumeration
L-9 Mon 15 Sep numerical integration
L-10 Wed 17 Sep eval and exec – callback, iterators, and generators
L-11 Fri 19 Sep command line arguments, encapsulation, and Tkinter

Project One due on Monday 22 September by 9AM

L-12 Mon 22 Sep graphical user interfaces with Tkinter
L-13 Wed 24 Sep root finding methods – wrapping external software
L-14 Fri 26 Sep numpy, vectorization, animations with matplotlib
L-15 Mon 29 Sep curve plotting and animations with matplotlib and Tkinter
L-16 Wed 1 Oct space curves and surfaces
L-17 Fri 3 Oct solving ordinary differential equations
L-18 Mon 6 Oct packaging Python code and Sphinx documentation
L-19 Wed 8 Oct review of materials covered in lectures 1 to 18
L-20 Fri 10 Oct midterm exam – either in class or take home
L-21 Mon 13 Oct web clients and crawlers
L-22 Wed 15 Oct reading and processing data from web pages
L-23 Fri 17 Oct using a database to manage and process data
L-24 Mon 20 Oct numeric, symbolic, and algorithmic differentiation
L-25 Wed 22 Oct interval and QD arithmetic – extending Python

Project Two due on Friday 24 October by 9AM

L-26 Fri 24 Oct operator overloading and inheritance
L-27 Mon 27 Oct CGI scripting and web interfaces
L-28 Wed 29 Oct network programming
L-29 Fri 31 Oct random walks and cellular automata
L-30 Mon 3 Nov running Cython
L-31 Wed 5 Nov Twisted network programming
L-32 Fri 7 Nov Maxima and Pexpect
L-33 Mon 10 Nov Pexpect and Regular Expressions
L-34 Wed 12 Nov computational group theory with GAP
L-35 Fri 14 Nov higher arithmetic with PARI/GP
L-36 Mon 17 Nov computing with polynomials in Singular
L-37 Wed 19 Nov statistical computing with R
L-38 Fri 21 Nov the Message Passing Interface (MPI) for Python with mpi4py

Project Three due on Monday 24 November by 9AM

L-39 Mon 24 Nov testing software
L-40 Wed 26 Nov solving polynomial systems with PHCpack and phepy
   Fri 28 Nov Thanksgiving holiday. No classes.
L-41 Mon 1 Dec presentation of projects or review for final exam
L-42 Wed 3 Dec presentation of projects or review for final exam
L-43 Fri 5 Dec presentation of projects or review for final exam

8-12 December, final examinations, data, time, and room to be announced.